PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING THE FILING OF AMENDMENTS OF THE CLAIMS

(PCT Administrative Instructions, Section 417)

To:

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Date of mailing (day/month/year) 05 October 2005 (05.10.2005)	
Applicant's or agent's file reference 05-8058-SNY	**IMPORTANT NOTIFICATION**
International application No. PCT/JP2005/010928	**International filing date** (day/month/year) 15 June 2005 (15.06.2005)
Applicant SONY CORPORATION et al	

1. The applicant is hereby notified that amendments to the claims under Article 19 were received by the International Bureau on:

   26 September 2005 (26.09.2005)

2. This date is within the time limit under Rule 46.1.

   Consequently, the international publication of the international application will contain the amended claims according to Rule 48.2(f), (h) and (i).

3. The applicant is reminded that the international application (description, claims and drawings) may be amended during the international preliminary examination under Chapter II, according to Article 34, and in any case, before each of the designated Offices, according to Article 28 and Rule 52, or before each of the elected Offices, according to Article 41 and Rule 78.

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland** Facsimile No. (41-22) 338.90.90	Authorised officer Fabienne LAMPIS (Fax 338 9090) Telephone No. (41-22) 338 9506

26/09/2005

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COPY

Amendment of the claims under Article 19(1) (Rule 46)

International Application No.: PCT/JP2005/010928
International Filing Date: 15/06/2005
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Agent's File reference: 05-8058-SNY

Dear Sirs:

The applicant, who received the International Search Report relating to the above-identified International Application transmitted on July 26, 2005 hereby files an amendment under Article 19(1) as in the attached sheets.

In the amendment, claims 1 and 15 to 27 are amended, and claims 13, 14, 28, and 29 are added.

The applicant also files as attached herewith a brief

statement explaining the amendment and indicating any impact that amendment therein might have on the description and drawings.

Very truly yours,

Takahisa Satoh

Takahisa SATOH

Attachment:

(1) Amendment under Article 19(1) 6 sheets
(2) Brief Statement 1 sheet

1. (Amended)

A semiconductor light emitting device, comprising:

a substrate;

a first conductive type first cladding layer formed on said substrate;

an active layer formed on said first cladding layer; and

a second conductive type second cladding layer formed on said active layer, a part thereof having a ridge-shaped portion as a current narrowing structure;

wherein said ridge-shaped portion of said second cladding layer includes a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer; and

bandgaps of said first cladding layer and said second ridge-shaped layer have a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

2. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer and said second ridge-shaped layer are a layer with a high aluminum composition ratio and a layer with a low aluminum composition ratio, respectively.

3. A semiconductor light emitting device as set forth

in claim 2, wherein

an aluminum composition ratio X1 of said first ridge-shaped layer is $0.60 \leq X1 \leq 0.70$, and

an aluminum composition ratio X2 of said second ridge-shaped layer is $X2 \leq X1$.

4. A semiconductor light emitting device as set forth in claim 2, wherein

an aluminum composition ratio X1 of said first ridge-shaped layer is 0.70, and

an aluminum composition ratio X2 of said second ridge-shaped layer is 0.65.

5. A semiconductor light emitting device as set forth in claim 1, wherein a film thickness of said first ridge-shaped layer is 50 to 400 nm.

6. A semiconductor light emitting device as set forth in claim 1, wherein a sum of a film thickness of a portion excepting said ridge-shaped portion of said second cladding layer and a film thickness of said first ridge-shaped layer is 750 nm or smaller.

7. A semiconductor light emitting device as set forth in claim 1, wherein an etching stop layer is formed on a boundary face of a portion excepting the ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

8. A semiconductor light emitting device as set forth

in claim 1, wherein said first cladding layer, said active layer and said second cladding layer are formed by an AlGaInP-based material.

9. A semiconductor light emitting device as set forth in claim 1, wherein said first cladding layer, said active layer and said second cladding layer are formed by an AlGaN-based material.

10. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer is formed by a layer having an equal refractive index to that of a portion excepting said ridge-shaped portion of said second cladding layer.

11. A semiconductor light emitting device as set forth in claim 1, wherein said first ridge-shaped layer is formed by a layer having a lower refractive index than that of a portion excepting said ridge-shaped portion of said second cladding layer.

12. A semiconductor light emitting device as set forth in claim 11, wherein an aluminum composition ratio of a portion excepting said ridge-shaped portion of said second cladding layer is 0.68, and

an aluminum composition ratio of said first ridge-shaped layer is 0.75 to 0.80.

13. (Added)

A semiconductor light emitting device, comprising:

a substrate;

a first conductive type first cladding layer formed on said substrate;

an active layer formed on said first cladding layer; and

a second conductive type second cladding layer formed on said active layer, a part thereof having a ridge-shaped portion as a current narrowing structure;

wherein said ridge-shaped portion of said second cladding layer includes a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer;

a bandgap of said second ridge-shaped layer has a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer; and

an etching stop layer is formed on a boundary face of said portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

14. (Added)

A semiconductor light emitting device, comprising:

a substrate;

a first conductive type first cladding layer formed on said substrate;

an active layer formed on said first cladding layer; and

a second conductive type second cladding layer formed on said active layer, a part thereof having a ridge-shaped portion as a current narrowing structure;

wherein said ridge-shaped portion of said second cladding layer includes a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer;

a bandgap of said second ridge-shaped layer has a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer; and

said first cladding layer, said active layer and said second cladding layer are formed by an AlGaInP-based material.

15. (Amended)

A method of producing a semiconductor light emitting device, including:

a step of forming at least a first conductive type first cladding layer, an active layer and a second conductive type second cladding layer by stacking on a substrate by an epitaxial growth method; and

a step of processing a ridge-shaped portion as a current narrowing structure at a part of said second

cladding layer;

wherein, in the step of forming said second cladding layer, a portion to be said ridge-shaped portion is formed to include a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer; and

in the step of forming said first cladding layer and the step of forming said second cladding layer, they are formed to obtain that bandgaps of said first cladding layer and said second ridge-shaped layer have a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

16. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

in the step of forming said second cladding layer, a layer having a high aluminum composition ratio and a layer having a low aluminum composition ratio are formed as said first ridge-shaped layer and said second ridge-shaped layer, respectively.

17. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 16, wherein

in the step of forming said second cladding layer,

a layer having an aluminum composition ratio X1 satisfying $0.60 \leq X1 \leq 0.70$ is formed as said first ridge-shaped layer and a layer having an aluminum composition ratio X2 of $X2 \leq X1$ as said second ridge-shaped layer.

18. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 16, wherein

in the step of forming said second cladding layer, a layer having an aluminum composition ratio X1 of 0.70 is formed as said first ridge-shaped layer and a layer having an aluminum composition ratio X2 of 0.65 is formed as said second ridge-shaped layer.

19. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

in the step of forming said second cladding layer, said first ridge-shaped layer is formed to have a film thickness of 50 to 400 nm.

20. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

in the step of forming said second cladding layer, a sum of a film thickness of a portion excepting said ridge-shaped portion of said second cladding layer and a

film thickness of said first ridge-shaped layer is made to be 750 nm or smaller.

21. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

the step of forming said second cladding layer includes a step of forming an etching stop layer on a boundary face of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

22. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 21, wherein

in the step of processing said ridge-shaped portion as the current narrowing structure at the part of said second cladding layer, the part of said second cladding layer is processed to be said ridge-shaped portion by etching which stops at said etching stop layer.

23. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein said first cladding layer, said active layer and said second cladding layer are formed by an AlGaInP-based material.

24. (Amended)

A method of producing a semiconductor light

emitting device as set forth in claim 15, wherein said first cladding layer, said active layer and said second cladding layer are formed by an AlGaN-based material.

25. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

in the step of forming said second cladding layer, a layer having a same refractive index as that of a portion excepting said ridge-shaped portion of said second cladding layer is formed as said first ridge-shaped layer.

26. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 15, wherein

in the step of forming said second cladding layer, a layer having a lower refractive index than that of a portion excepting said ridge-shaped portion of said second cladding layer is formed as said first ridge-shaped layer.

27. (Amended)

A method of producing a semiconductor light emitting device as set forth in claim 26, wherein

in the step of forming said second cladding layer, a layer having an aluminum composition ratio of 0.68 is formed as a portion excepting said ridge-shaped portion

of said second cladding layer and a layer having an aluminum composition ratio of 0.75 to 0.80 is formed as said first ridge-shaped layer.

28. (Added)

A method of producing a semiconductor light emitting device, including:

a step of forming at least a first conductive type first cladding layer, an active layer and a second conductive type second cladding layer by stacking on a substrate by an epitaxial growth method; and

a step of processing a ridge-shaped portion as a current narrowing structure at a part of said second cladding layer;

wherein, in the step of forming said second cladding layer, a portion to be said ridge-shaped portion is formed to include a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer, and the second cladding layer is formed to obtain that a bandgap of said second ridge-shaped layer has a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer; and

the step of forming said second cladding layer includes a step of forming an etching stop layer on a

boundary face of said portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer.

29. (Added)

A method of producing a semiconductor light emitting device, including:

a step of forming at least a first conductive type first cladding layer, an active layer and a second conductive type second cladding layer by stacking on a substrate by an epitaxial growth method; and

a step of processing a ridge-shaped portion as a current narrowing structure at a part of said second cladding layer;

wherein, in the step of forming said second cladding layer, a portion to be said ridge-shaped portion is formed to include a first ridge-shaped layer on the side close to said active layer and a second ridge-shaped layer on the side distant from the active layer, and the second cladding layer is formed to obtain that a bandgap of said second ridge-shaped layer has a profile lower than bandgaps of a portion excepting said ridge-shaped portion of said second cladding layer and said first ridge-shaped layer; and

said first cladding layer, said active layer and said second cladding layer are formed by an AlGaInP-based

material.